

# HENRY

Hydraulic Engineering Repository

Ein Service der Bundesanstalt für Wasserbau

---

Conference Paper, Published Version

**Rigo, Philippe**

## **PIANC: An Opportunity for International Contacts and Experience Exchanges**

---

Verfügbar unter/Available at: <https://hdl.handle.net/20.500.11970/101982>

Vorgeschlagene Zitierweise/Suggested citation:

Rigo, Philippe (2012): PIANC: An Opportunity for International Contacts and Experience Exchanges. In: Bundesanstalt für Wasserbau (Hg.): Innovation mit Tradition: Hydraulischer Entwurf und Betrieb von Wasserbauwerken. Karlsruhe: Bundesanstalt für Wasserbau. S. 7-16.

### **Standardnutzungsbedingungen/Terms of Use:**

Die Dokumente in HENRY stehen unter der Creative Commons Lizenz CC BY 4.0, sofern keine abweichenden Nutzungsbedingungen getroffen wurden. Damit ist sowohl die kommerzielle Nutzung als auch das Teilen, die Weiterbearbeitung und Speicherung erlaubt. Das Verwenden und das Bearbeiten stehen unter der Bedingung der Namensnennung. Im Einzelfall kann eine restriktivere Lizenz gelten; dann gelten abweichend von den obigen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Documents in HENRY are made available under the Creative Commons License CC BY 4.0, if no other license is applicable. Under CC BY 4.0 commercial use and sharing, remixing, transforming, and building upon the material of the work is permitted. In some cases a different, more restrictive license may apply; if applicable the terms of the restrictive license will be binding.



## **PIANC: An Opportunity for International Contacts and Experience Exchanges**

Prof. Dr. Ir. Philippe Rigo, University of Liège, ANAST, Belgium

### **Abstract**

PIANC is one of the oldest and most active international associations. Through working groups dealing with different topics, PIANC provides to experts the opportunity to develop contacts and exchanges information with colleagues from other countries.

Der internationale Austausch zwischen Experten bedarf einer Plattform. PIANC ist eine der ältesten weltweit tätigen technischwissenschaftlichen Vereinigungen und bietet die Möglichkeit, über Arbeitsgruppen zu verschiedenen Fachthemen mit Kollegen aus anderen Ländern in Kontakt zu kommen.

### **PIANC: the “Word Association for Waterborne Transport Infrastructure”**

This paper aims to explain how PIANC, the “*Word Association for Waterborne Transport Infrastructure* (<http://www.pianc.org>)”, represents a huge opportunity for international contacts and technical exchanges.

In fact, PIANC provides opportunities of international professional exchanges and contacts

- through the reading of PIANC reports,
- through the participation at PIANC WG,
- through technical and social events (Congress, Workshop, Conferences as SMART RIVERS 2013, <http://smartrivers2013.org>),
- Cooperation with other national and international organisations as, CCNR, ICOMIA, IAPH and IALA.

In addition, PIANC offers opportunity of multidisciplinary exchanges. For instance, inland navigation experts interact with environment, dredging problems, flood management,... and specialists from hydraulics and civil engineering may work with specialists in economist, steel structure, management, etc.

PIANC offers the opportunities to learn about positive and negative experiences of new products & concepts. For instance, for navigation movable weirs (WG101, 2006), the use of inflatable rubber membranes, the Obermeyer concept, etc. are presented.

Similarly, PIANC highlights new innovative concepts for the design of navigation locks (WG106, 2009):

- Monolith lock structure versus standard blocks and joints (BAW, Germany),
- The comeback of sliding lifting gates/valves versus rolling gates, owing to new low friction composite material (UHMWPE – Ultra High Molecular Polyethylene) (NL, Panama)
- ILCS chamber longitudinal curvert system for lock filling and emptying (USA)
- Pressure Chamber system, for lock filling and emptying (BAW, Germany)
- Miter gates with low reverse head (NL, UK)
- Use of bio oils
- Rotary sector gate for navigation locks, with water flow discharge capability (BAW, DE)
- Composite reinforced fibbers lock gate (NL, France)
- Self propelled and floating lock gate (BE)
- Prefabrication techniques and construction modes (NL, USA)

PIANC offers opportunity of identifying new challenges. For instance after the WG106 (2009) on navigation locks a series of new WGs have been launched :

- Impact of seismic loads on lock gates (WG 151)
- Ship Impact on lock gates (WG 151)
- Miter gate technologies (WG 154)
- Ship behaviour in navigation locks and lock approaches (WG 155)
- ...

**PIANC is** the global organisation providing guidance for sustainable waterborne transport infrastructure for ports and waterways. PIANC is the forum where professionals around the world join forces to provide expert advice on cost-effective, reliable and sustainable infrastructure to facilitate the growth of waterborne transport. Established in 1885, PIANC continues to be the leading partner for government and private sector in the design, development and maintenance of ports, waterways and coastal areas.

As a non-political and non-profit organisation, PIANC brings together the best international experts on technical, economic and environmental issues pertaining to waterborne transport infrastructure. Members include national governments and public authorities, corporations and interested individuals. Providing expert guidance and technical advice PIANC provides guidance to public and private partners through high-quality technical reports. The international Working Groups develop regular technical updates on pressing global issues to benefits members on shared best practices.

**PIANCs strategic objective is to remain the leading international source of waterborne transport-related information in the 21st century**

PIANC is composed formally of national bodies (countries), which are the core members, and of individual members (companies, institutions and individual persons). In May 2011 the PIANC countries were:

Argentina	Denmark	Korea	Serbia
Australia	Estonia	Laos	South Africa
Austria	Finland	Monaco	Spain
Belgium	France	Morocco	Sweden
Brazil	Germany	Netherlands	Switzerland
Cambodia	Iceland	Norway	United Kingdom
Canada	Iran	Panama	USA
P.R. China	India	Poland	Vietnam
CCNR	Italy	Portugal	
Czech Republic	Japan	Romania	

#### Seven (7) good reasons to join PIANC

1. Join a world-wide **network** of fellow experts and professionals
2. Benefit from more than a century of **expertise**
3. Gain access to advanced **technical information**
4. Share your knowledge and experience through **Working Groups, Commissions** and **National Sections**
5. Make your voice heard within the community and on the **international** scene
6. Use a unique springboard for **Young Professionals**
7. Team up with **public decision-makers**

#### The missions of PIANC

##### ➔ To provide expert guidance and technical advice

- o Bringing together the best international experts, both public and private, on technical, economic and environmental issues pertaining to waterborne transport infrastructure
- o High-quality Technical Reports;
- o International Commissions:
  - InCom : Inland Navigation Commission
  - MarCom : Maritime Navigation Commission
  - EnviCom : Environmental Commission
  - RecCom : Recreational Navigation Commission
  - CoCom : International Co-operation Commission
  - YP-Com : Young Professionals Commission -YP (members below 35-40 years old)
- o Working Groups, presenting in reports the state of the art of various topics. A WG is typically composed of 8 to 12 members, with in principle 1 delegate per country and few YPs).

→ To keep the international waterborne transport community connected:

- o Four-yearly International Congresses - as Liverpool'2010, San Francisco 2014),
- o Four-yearly PIANC-COPEDEC International Conferences on Coastal and Port Engineering in Developing Countries
- o Quarterly e-Magazine On Course
- o E-Newsletter Sailing Ahead
- o Website: [www.pianc.org](http://www.pianc.org)

→ To support “Young Professionals and Countries in Transition”

### **PIANC Working Groups, the best opportunities for international exchanges**

Participation in international Working Groups results in worthwhile contact with experts concerned to study technical and managerial matters of current importance.

Key concerns of PIANC relate to **Climate Change** and how to **Work with Nature**

### **PIANC Climate Change**

Climate change is causing changes in precipitation patterns, sea levels, wind and wave conditions and water temperature, amongst others, with associated consequences for the frequency and intensity of extreme events. These changes will have implications for navigation and navigation infrastructure globally. While site-specific effects will vary, the navigation sector needs to act both to reduce emissions which are contributing to warming and to prepare to deal with the now somewhat inevitable effects of climate change.

Climate change will affect both inland and maritime navigation including commercial and recreational activities and infrastructure, as well as operational activities such as dredging. Measures that aim to reduce the navigation sectors contribution to the problem by directly or indirectly reducing emissions of greenhouse gases (GHG) are referred to as **mitigation** measures. Measures which aim to increase resilience and to reduce vulnerability to the effects of climate change are referred to as **adaptation** measures.

Another potential impact associated with global warming will be opportunities to develop new navigation routes notably as a result of ice melt in Arctic regions. However, while this would represent a benefit to navigation in terms of shorter routes, cost savings, etc., and while such routes may help to reduce net emissions from shipping, careful attention is required concerning the local environmental impacts of such activity.

PIANC has recognised the importance of climate change for the navigation sector. Therefore, a Permanent Task Group on Climate Change (PTG CC) was established. The PTG CC is comprised of national experts, representatives of the PIANC Commissions and sister association representatives and is undertaking a variety of activities with respect to climate change and navigation.

### **Working with Nature**

Working with Nature is a PIANC Position Paper which calls for an important shift in thinking in our approach to navigation development projects to help deliver mutually beneficial, win-win solutions. It promotes a proactive, integrated philosophy which:

- focuses on achieving the project objectives in an ecosystem context rather than assessing the consequences of a predefined project design; and
- focuses on identifying win-win solutions rather than simply minimising ecological harm.

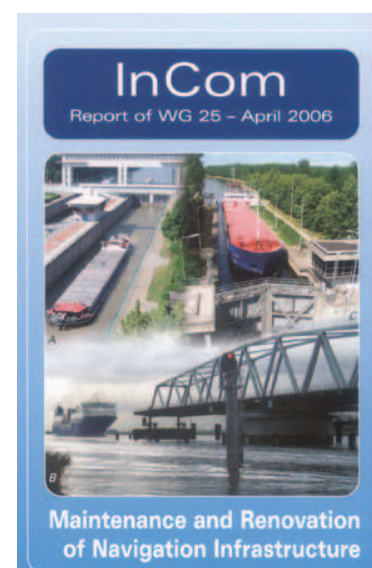
In essence, adopting the “*Working with Nature*” philosophy means doing things in a different order. Instead of developing a design and then assessing its environmental impacts an approach which inevitably revolves around damage limitation and is ultimately not sustainable “*Working with Nature*” advocates the following steps:

- Establish project need and objectives
- Understand the environment
- Make meaningful use of stakeholder engagement; identify win-win options
- Prepare project proposals/design to benefit navigation and nature

Here after are given few examples of opportunities, through PIANC WGs, getting feedbacks from international experiences in the field of hydraulic structures and river navigation.

### **Maintenance and renovation of navigation infrastructure - WG25 (INCOM, 2006)**

In many countries navigation infrastructure is approaching, or has reached or moved beyond its design life. Preservation and extended use of existing facilities is dependent upon efficient operation, inspection, maintenance, repair and renovation of these structures. With the development of whole life project costing, the need to identify maintenance and replacement cycles is also vital to compare different investment opportunities.





### **Design of Movable weirs and Strom Surge Barriers - WG101 (2007) and INCOM WG26 (2006)**

The aim of the WG is to conduct a comprehensive review (State of Art) of the modern technologies, design tools and recent researches used to design and build structures controlling water level and flow in rivers, waterways and ports (for navigation & flood protection). For that purpose, design of movable weirs and gated control structures are reviewed.

### **Innovations in Navigation Lock Design - WG106 (2009)**

Locks are key structures for the development of the navigation in canals and in natural rivers where weirs regulate water levels to enable navigation. They may also be strategic infrastructure for port development.

In lower elevation regions, such as New Orleans and the Netherlands, locks are structures in dikes and also have an important task in flood defence.

In 1986, PIANC produced a comprehensive report on Locks (PIANC, 1986). For about twenty years this report has been considered as a world reference guideline. PIANC decided in 2006 to launch a new Working Group (WG) to update the report, and this present report is the result. The new report must be considered as a complement to previous, and focuses on new design techniques and concepts. Innovations and changes that have occurred since 1986 are the main target of the present report.

The core of this report has three major parts. The first part presents an exhaustive list of design goals associated with locks. This section is particularly important for decision makers who have to launch a new project. The second part reviews the design principles that must be considered by designers. This section is methodology oriented. The third part is technically oriented. All main technical aspects (hydraulics, structures, foundations, etc.) are reviewed, focussing on changes and innovations occurring since 1986. Perspectives and trends for the future are also listed. When appropriate, recommendations are listed.

Major changes since 1986 concern maintenance and operational aspects, and more specifically how to consider these criteria as goals for the conceptual and design stages of a lock. Renovation and rehabilitation of existing locks will be an increasingly important topic for the future



### **Impacts of seismic loads and vessel impact on lock gates - WG151 (In progress)**

The main objective of the WG 151 is to define a general methodology for the analysis and design of lock gates and approach structures considering seismic loads and vessel impact.

In 2010, current practice for the design of lock gates and approach structures is a relatively standard activity for a suitably experienced engineering company if the design requirements and the load cases are clearly specified. Relevant, robust, reliable and effective software is available to assess the strength (stress, deformation, buckling, damage limitations etc) of lock gates and approach structures even if exceptional load cases must be considered.

Numerical tools to study the effects of seismic loads and vessel impacts on lock gate structures are available but there are no design guidelines to be considered in determining the effects of seismic loads or vessel impact on gate structures and approach works.

### **Ship behaviour in locks and lock approaches- WG155 (In progress)**

The manoeuvring of ships in the approach of locks and the behaviour of the ships in the lock itself is a key factor for the hydraulic design of the locks. The design can significantly impact on the forces which act on the ship, as it approaches the lock, is being moored and moved upwards or downwards. The forces are the basis for the safety of the locking process, as they affect the ease to enter in the lock and the forces that are imposed on hawsers and bollards.

WG106 on “Innovation in navigation lock design” focused on general guidelines for lock design and it became clear, that the above topic could not be covered in sufficient depths. Thus, it is necessary to concentrate on the topic in a new dedicated working group. Then, the new WG 155 investigates and reports on:

- An overview of the current knowledge to evaluate the forces which act on a ship while entering a lock and during the locking process;
- Methodologies to assess the acceptable levels of these forces;
- Guidelines in different countries to handle the design process in order to achieve the desired level of safety.

### **Economic aspects of inland waterways - WG21 (INCOM, 2005)**

Transport infrastructure plays a key role in economic development. A country's economic growth and prosperity depend on having well-developed transport systems. Transport infrastructure projects are generally extremely expensive and have a long lifespan. In order to ensure that investment in transport infrastructure is as effective as possible, most countries and supra-national organisations try to evaluate their projects. However, the standard of planning and evaluation systems, usually based on cost-benefit and multi-criteria analysis, varies greatly from country to country and between the various modes of transport. This report looks at the situation and the evaluation methods for waterway, rail and road projects. The main focus, of course, is on the waterway system, but always with an eye to the competing transport systems. In order to maximise the benefits for the whole economy, the overall economic cost-benefit ratio is generally regarded as the appropriate evaluation criterion, but in many cases additional non-monetary factors complement the financial results. This report reviews the determining parameters and evaluation methods.

### **Performance Indicators for Inland Waterways Transport – WG 111 (2010)**

As there were no transnational, commonly accepted and system wide set of performance indicators in the field of inland navigation, PIANC InCom WG 32 has taken the assignment to develop and recommend a set of measures for the evaluation of the performance of transport along inland waterways. This WG 111 was gathering input from the entire logistics chain to define what are important expectations and metrics for performance on inland navigation.

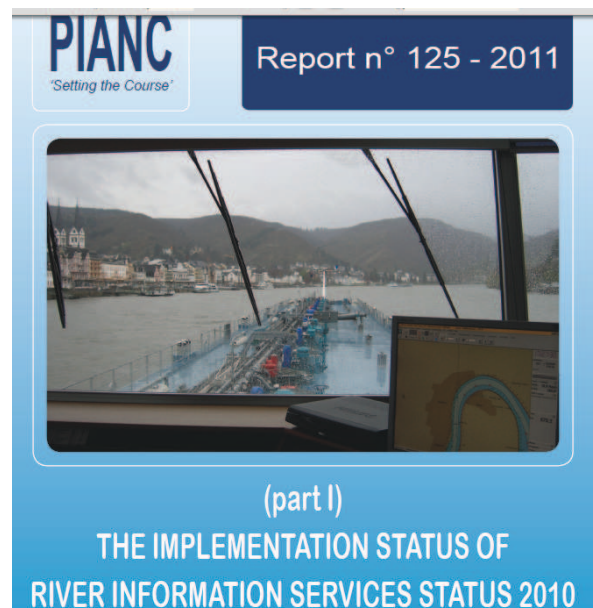


The aim of this report is to recommend performance measurement and a set of performance indicators in the field of inland navigation. It supports practitioners in inland navigation and even those outside (academia, other transport modes, authorities, etc.) with an advanced standard set of performance indicators. In order to improve processes, the given standard set of performance indicators shall be seen as a starting point in order to ease comparability of the performance with other transport modes.

### **River Information Services (RIS) - WG125, 2012**

In the last few years there has been seen a growing political and environmental interest for sustainable development in transport. Inland navigation is regarded as an alternative means of transport for road transport as it is a more environment friendly means of transport and on some major transport connections there is still some spare capacity in the waterway infrastructure.

To enable safe and smooth navigation some countries have introduced inland VTS (Vessel Traffic services) systems. Some of these systems have already been in operation for over 15 years. To make inland navigation an even more attractive transportation mode than at present, research and demonstration projects have been initiated to construct so-called VTMISS<sup>1</sup> systems (Vessel Traffic Management Information Systems). These VTMISS should enable a wide variety of users to comprehensively plan resources used in inland navigation thus making possible just- in-time transport and making inland navigation a perfectly fitting partner of integrated transport chains. Currently within the EU, VTMISS is specified as RIS (River Information Services).



The development of VTS and VTMISS in inland navigation however is mainly being executed on a national basis. The European Union published in 2005 a directive on River Information Services (RIS). Implementation of these services will be effective in European countries in 2007/2008.

It can be an important role for a PIANC working group to make an update of developments on a regular basis and to give recommendations for the application of specific techniques, systems or services in non-European countries and to provide an interface with maritime information systems such as AIS.

### **e-Navigation for Inland Waterways - WG156 (in progress)**

In the first decade of the 21st century River Information Services have been developed to deal with the information services supporting traffic management and transport management. RIS has become mature and is in an implementation stage throughout the world.

In the maritime world ship and shore based stakeholders are more and more making use of systems to improve the safety, security, reliability and efficiency of waterborne transport. It is seen as essential to develop in the implementation of these technologies a more integrated and coordinated approach to avoid that in the future the added value of these technologies will hamper. Consequently there is, in the development of new systems, a growing need for:

- standardization and harmonisation
- efficient and simplified solutions,
- Interoperability.
- reduced burden to the users of systems
- Interaction and coordination between stakeholders and their systems throughout the transport chain.

In recent years the above mentioned experiences has lead to several conceptual developments that will have a relevant influence on the application of modern technology and information systems in the maritime domain.

## Conclusion

From my own experience, recommendations are:

- joint PIANC family and extend your contact network, makes it more international;
- joint a PIANC WG and get the feedback for international experiences.

Start by participating at SMART RIVER' 2013, at Liege (BE) and Maastricht (NL), 23-27 Sept 2013.

The main conference is 25-27 Sept 2013 at Liege, including technical visits.

Present at this conference your own activities in relation with the waterways.

Info on <http://smartrivers2013.org>



